March 2004 Volume 14, Number 1 PUB-RR-716

Information from Wisconsin Department of Natural Resources Bureau for Remediation and Redevelopment

RR NEWS

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FEATURE

Mann-Kendall Test – How To Apply Results

The Mann-Kendall, non-parametric statistical test is routinely used to assess trends in groundwater concentration data. Consultants and other parties working on contaminated properties often use the Mann-Kendall test and submit their results to the RR Program staff for review. However, program staff have noticed that, in some cases, individuals are applying the Mann-Kendall test results incorrectly.

The Mann-Kendall test is required for sites with petroleum contamination above groundwater standards, when parties request closure under Comm 46 and Chapter NR 746, Wis. Adm. Code (and under the applicable sections in NR 726, Wis. Adm. Code, that are cross-referenced in Comm46/NR 746). An alternative non-parametric test, Mann-Whitney, is also acceptable.

Please note that closure under Chapter NR 726 does not require any specific statistical test for data assessment. Nevertheless, Mann-Kendall is often used to support closure requests under NR 726 because it is readily available, easy to use, and the DNR has developed tools for its application.

Selecting Appropriate Tests

Selection of an appropriate statistical test requires careful consideration of the data available and the limitations of the test. The Mann-Kendall test procedure

starts by simply comparing the most recent round of water-quality datum with the results of all earlier rounds. A score of +1 is awarded if the most recent concentration is larger, or a score of –1 is awarded if it is smaller.

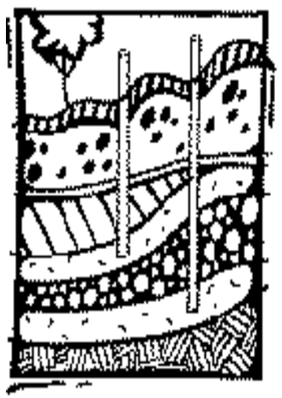
The total score for the time-series data is the Mann-Kendall statistic, which is then compared to a critical value, to test whether the trend in concentration is increasing, decreasing or if no trend in concentration can be determined. The simple procedure is illustrated on page 63 of the RR program's Natural Attenuation guidance (publication #RR-614), which is available at the following link: http://dnr.wi.gov/org/aw/rr/archives/pubs/RR614.pdf.

Mann-Kendall Limitations
The limitations of the Mann-Kendall (M-K) test include:

1. The test does not account for the magnitude of the data. The test can be applied to a data series in the 10's of ug/l as easily as a data series in the 1000's of ug/l. However, the larger the actual numbers, the less sensitive the test is to changes in the magnitude of numbers. For example, at an 80 percent confidence level, given benzene concentrations of 6, 10, 8, 13, and 10 ug/l, the M-K test would conclude that there was an increasing trend; while a series like 10; 9,000; 8,500; 9,500; and 8,900, the M-K test will conclude that this is a stable trend. In fact, the first series likely represents a stable trend while the second series – with a jump of more than two orders of magnitude – represents an increasing trend.

2. The test does not account for the temporal variation in the data such that we cannot obtain a degradation rate, nor account for variable "releases." Estimating degradation rates is important to determining the expected life time of the contaminant source and plume. To determine degredation rates, other data analysis tools, such as regression analysis, is needed. Actual data values may vary greatly. For instance, when "slugs" of contaminant are released due to seasonal water table fluctuations. Another example – M-K will determine that the following series has a decreasing trend: 0.23; 5; 43; 921; 1,340; 103; 1.62; 0.23; 0.23; and 0.23. In fact, the set of data is more indicative of a contaminant slug moving past the monitoring well (i.e., an advancing plume margin), especially if a more downgradient well shows an increasing trend. When there is not a downgradient well, the confidence in the M-K result decreases.

3. The data must be free of "seasonality." The underlying assumption for the M-K test is that declining or stable trends are due to the effects of natural attenuation processes. If factors other than NA processes – like differing analytical methods, over- or under-purging wells, using bailers or low-flow pumps – are observed to affect the sample results, use of the M-K test or use of the M-K test results would be suspect, and the test should not even be performed.



With the M-K test, the goal is to assess changes in water quality due to **time**. Other factors affect water quality over time, however – seasonality being one of them. Seasonal effects on water quality can be brought about by changes in the water-table elevations or in the groundwater flow gradient and direction. Appendix A of Comm 46 and NR 746 provides methods to determine whether data are affected by seasonality.

The RR Program also provides a tool to quickly assess the relationship between water elevation and contaminant concentration. The tool is a spreadsheet available on the program's web site as a zipped file, located at the following link: http://www.dnr.state.wi.us/org/aw/rr/ archives/pub_index.html#10 (RR-614.zip).

When the data appear to be seasonally affected, one way to reduce the seasonal bias in the M-K test is to include only data collected from the particular season with the highest contaminant concentrations. This would require a longer period of monitoring to collect sufficient data.

4. A "no trend" result does not equate to a stable plume. The no-trend result simply means that the M-K test could not discern either an up or a down trend for the given set of data, and in fact a "decreasing" or "increasing" result from the M-K test is a more robust conclusion than the "no trend" result.

A complication is brought about because, when the M-K test result shows "no trend," the DNR spreadsheet proceeds to estimate the coefficient of variation (CV) of the concentrations. The spreadsheet accepts a CV of less than or equal to 1 as equivalent to a stable plume. The CV estimation would tend to yield different conclusions for the high concentrations than for low concentrations, and would favor tagging higher concentrations as stable.

MANN-KENDALL TEST – HOW TO APPLY RESULTS (CON'T.)

This can be easily shown by comparing two "no trend" results: a set of high numbers (e.g. 4,300; 5,500; 8,000; 5,500) and a set of low numbers (85, 393, 22, 45). The absolute difference among the larger-number set is in the 1000's, while among the smaller numbers, at least an order of magnitude less. However, the CV for the larger-number set (CV = 0.3) is less than for the smaller number sets (1.3). Therefore, "stability," when defined as being CV≤1, would favor the larger-number set.

The CV estimation can provide the wrong impression when the M-K test has already failed to discern a trend. While the DNR spreadsheet accepts a no-trend result at an 80 percent confidence level, and a CV≤1 as equivalent to a "stable" plume, the fact is that careful thought must be given to the data before this conclusion can be accepted. This is especially true when a small data set – the minimum of four rounds – is used in the spreadsheet.

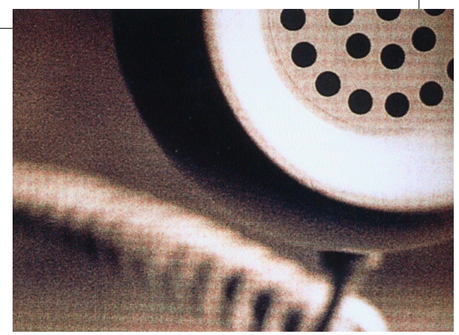
It is strongly recommended that more than the minimum four rounds of data be assessed in the M-K test. The department's guidance recommends that at least six rounds of data be used in the spreadsheet. It is only common sense that, the less data available, the less reliable the conclusions will be based on that data.

In a related concern, sometimes a large data set exists but it is truncated in the M-K analysis. That is, the user selects only the last four rounds of data for analysis, even though more data exists. This is inappropriate. The DNR spreadsheet has a limit of 10 data/well. This is because a different M-K algorithm is used for more than 10 rounds of data. If more than 10 rounds of data exist, we recommend the user choose the most appropriate of the following responses:

- assessing the seasonality of the data and test data from the season of the year that exhibits the highest contaminant concentrations;
- use the latest 10 rounds of data; or
- use a different statistical test that will accommodate more data rounds.

The Mann-Kendall test is a tool that is appropriate to use in some situations with some data sets. It should be used only after careful assessment of the data and a determination that the test is appropriate for the data set. Consultants and other parties utilizing the test are encouraged to use the whole range of data assessment tools available. Several alternatives to the Mann-Kendall test for data trends are discussed in the DNR guidance about the test, located at the following link: http://dnr.wi.gov/org/aw/rr/archives/pub_index.html#15. For more information, please contact Terry Evanson at 608-266-0941, or theresa.evanson@dnr.state.wi.us.

RR PROGRAM TO DISCONTINUE INFORMATION LINE



The RR Program has decided to discontinue the Information Line, a telephone service the Program has offered to the general public for several years.

The Information Line was created in the mid-1990s when the DNR established the Remediation and Redevelopment Program. The Line helped the public obtain publications, phone numbers and other program information. However, in the past several years the Line had averaged about 20-30 calls per month, far below the high volumes received in the early stages of the Program. In 2003, the volume dropped to only 10-15 calls per month.

The decline may relate to the wide public use of the DNR Internet pages. Many of our customers have indicated that they use the Internet quite extensively for publications, funding updates, meetings, and other information they previously obtained via the Information Line.

Service To End June 30
The last date of the Information Line service will be June 30 of this year. A recorded message will indicate when the agency will discontinue service of the line, and after that date any individuals calling the Line will be forwarded to a receptionist for assistance.

If you have any questions, please contact Andrew Savagian at 608-261-6422, or andrew.savagian@dnr.state.wi.us.

Avoid Problems With Laboratory Data

In submitting data to the RR Program, individuals must use a certified or registered laboratory per requirements in Chapter NR 149, Wis. Adm. Code (Laboratory Certification and Registration). Some consulting firms have been overlooking this requirement – often as early as during a bid process, but also when submitting work plans, site investigations, remedial activities, during long-term monitoring and sometimes even at requests for case closure.

It is possible that familiarity with a lab can lead to overlooking its current certification status. Not all labs are certified in all test categories. Some categories include multiple parameters, and labs are certified separately for each parameter within the category. In addition, a large analytical service may have multiple locations, and each location needs to be certified for the test categories being analyzed.

Finally, don't forget that certifications need to be renewed. A lab that was certified a year ago for all parameters needed for a site investigation may, for a number of reasons, not be currently certified. It is not unusual for a certified lab to lose or withdraw certification for one or more parameters staff formerly maintained.

Saving Time And Money

The remedy is simple. It's a lot easier, time and money-wise, to avoid lab certification problems by careful planning early in the process, rather than be faced later on with unusable data. After the analytical parameters included in field work have been established, use the following "Commercial Laboratories" link to determine a lab's certification status for those parameters: http://www.dnr.state.wi.us/org/es/science/lc/search/.

Note that other lists on the same web page show the status of labs performing specific analyses (e.g. pesticides, petroleum, etc). Be sure you check the lab location that you will actually be using. Also, please remember when a certified lab subcontracts with another lab, the subcontracted lab must have the same certification.

For some multi-analyte methods, typically organics, certification is offered under more than one test category, and it's usually based on technology. Be certain that the laboratory holds certification for the technology being used. For example, if the parameter is a polycyclic aromatic hydrocarbon (PAH), HPLC method 8310 is often used due to its low detection limits (test category 13).

However, labs are developing methods for PAHs that operate the mass spectrometer in selected ion monitoring mode, or SIM. This allows detection limits that equal or surpass HPLC. Because SIM is an option under method 8270C, it meets the methods requirements of Chapter NR 716, Wis. Adm. Code. In this case, however, the lab would need to be certified either for semi-volatiles by gas chromatography/mass spectrometry (GC/MS) under test category 12 (organic; semi-volatiles by GC/MS) or for PAHs by GC/MS SIM under test category 19 (any single analyte or analyte group). If a lab can achieve low enough detection limits for PAHs, either method may be used for groundwater analysis.

For More Information

If you have questions about laboratory certification, please contact Rick Mealy, DNR Science Services, at 608-264-6006, or richard.mealy@dnr.state.wi.us. For questions about RR Program chemistry issues, please contact Charlene Khazae at 608-267-0543, or charlene.khazae@dnr.state.wi.us.

SUCCESS STORIES

MetalFab Makeover – Reclaiming Abandoned Industry In Columbus

The redevelopment of brownfields is often hindered by many factors – lack of funding, community worries about liability, unknown contaminants buried underground, or petroleum leaking into groundwater are just a few examples.

If one or more of these factors are present at a property, the cleanup and redevelopment efforts at a site may languish for years, creating the infamous eyesore and blight most communities are all too familiar with. This may hit home even more if the property lies within the bounds of a small town or an economically depressed area.

However, if the circumstances are right, a community comes together to take a brownfields challenge head on, partners with state agency staff like the DNR's Remediation and Redevelopment Program and creates a shared goal and vision to overcome the obstacles at a contaminated property. Such is the case in the small community of Columbus in southcentral Wisconsin.

MetalFab, Inc., owned and operated a custom metal plating and painting facility in Columbus until filing for bankruptcy in 1989. Subsequently, the property lay idle for several years. In 1997, with the assistance of funding through the federal Brownfield Environmental Assessment Program (BEAP), RR Program hydrogeologist Paul Kozol conducted Phase I and II site assessments for the property to help jump-start the investigation and clean up of the property.

City of Columbus officials began proactively redeveloping the property, enlisting several state programs to begin the process of erasing the site's blighted conditions.

MetalFab before cleanup. The company conducted metal plating and painting operations at the site until declaring bankruptcy in 1989 (photo by Paul Kozol, DNR).

MetalFab Makeover – Reclaiming Abandoned Industry In Columbus (con't.)

They created an Environmental Remediation Tax Incremental Financing (ER TIF) district surrounding the property to reimburse some of the city's environmental costs. The city was also awarded two key state brownfields grants: a DNR Site Assessment Grant (SAG) of $29,000 to demolish blighted and unsafe structures, and a Department of Commerce brownfields grant of $167,000 to renovate the remaining building as well as aid in the property's cleanup.

Renovation of the building included new paint, windows, and fixtures. Polychlorinated biphenyl (PCB) ballasts from the past lighting systems were removed as well as asbestos from some of the former piping systems.

In early 2000, the county foreclosed on the property and transferred it to the city for the back tax value of $60,000. The city subsequently transferred the property to 951 Associates, a development corporation, for the $60,000 back tax amount.

The development company entered into the DNR's Voluntary Property Liability Exemption (VPLE) process and performed a full site investigation. Remediation of the site included removal of a previously undocumented 8,000-gallon fuel oil tank and 48 tons of contaminated soil associated with the leaking tank.

Removal of 99 tons of soil contaminated with PCB's and polycyclic aromatic hydrocarbons (PAHs) was another component of the property's remediation. Groundwater investigations found low levels of the de-greaser compound trichloroethylene at the site, which continues to naturally degrade.

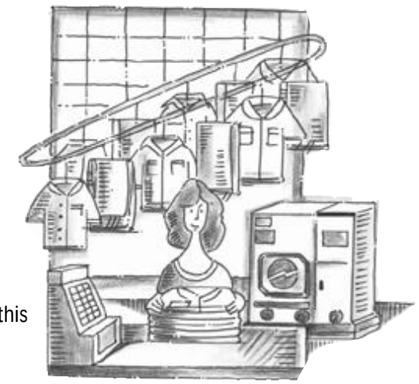
With the environmental issues now addressed and redevelopment in place, the property is back on the county's tax rolls. The building currently houses three business tenants while a search continues for a permanent tenant to utilize the entire facility. Columbus officials have a new assessed value for the property of $196,800, compared to a negative value before investigation and cleanup began.

The redevelopment of the MetalFab property is an excellent example of how the synergy of public and private partners, coupled with the redevelopment tools offered by state agencies, can bring about tremendous economic and aesthetic benefits for a small Wisconsin community.

MetalFab in 2003 after remediation activities were completed. With technical and financial assistance from the DNR and the Department of Commerce, including a DNR Site Assessment Grant of $29,000, the property was cleaned up and the above building was refurbished (photo by Eric Michaels, DNR).

Inside the renovated MetalFab building. Three businesses are currently located on-site, and developers are looking for a permanent tenant (photo by Eric Michaels, DNR).

Investigation and Removal at Neenah Dry Cleaner Site Tackles Tough Cleanup



In 1995, DNR officials discovered a release of perchloroethylene, or "perc" – the chemical used in the drycleaning process – from Donaldson's One Hour Cleaners in Neenah during the cleanup of a petroleum release at a neighboring gas station. With the assistance of RR Program staff and the Dry Cleaner Environmental Response Fund (DERF), the consultant at the property, Northern Environmental, implemented innovative investigation techniques and interim cleanup actions for this contamination in fractured dolomite bedrock.

The Dry Cleaner Environmental Response Fund (DERF) is a DNR program that reimburses dry cleaners for the costs associated with the investigation and cleanup at a contaminated drycleaner property. It is funded by a fee on drycleaning receipts, as well as charges for the use of perchloroethylene and other solvents paid by chemical distributors. The state collects approximately $1 million/year in revenue for the DERF. For more information about this funding program, please click on the following link: http://www.dnr.state.wi. us/org/aw/rr/financial/dryclean.html.

Investigation and Removal

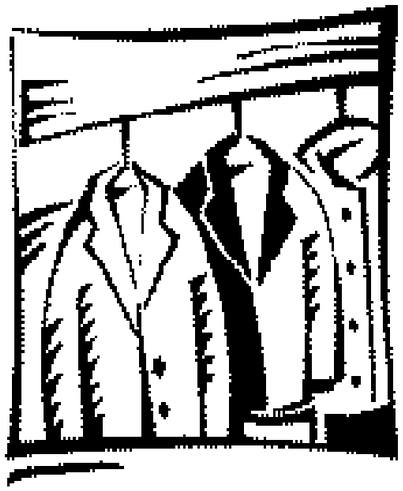
Consultants started full scale investigation into the release in 1999. As contamination was confirmed at each location, the investigation moved out further from the area the release took place, called the "source area". Evaluation of the initial soil and groundwater data revealed the presence of significant contamination in clay and fractured bedrock. It became clear that action had to be taken at the source area to stop the continued release to groundwater while the investigation continued.

Northern Environmental excavated 60 tons of contaminated clay in October 2000 and installed a vapor extraction/groundwater extraction (VEGE) system in July, 2001. The VEGE system extracted harmful vapors out of the top of bedrock and extracted the highest groundwater contamination from the bedrock in the source area. Contamination recovered by the VEGE system was treated on site by an air stripper. This system essentially strips the harmful volatile contaminants off the soil, bedrock and groundwater and discharges the volatiles through an air emissions stack, regulated by the DNR.

While the VEGE system recovered contamination from the source area, Northern Environmental went on to discover how far and how deep the contamination traveled within the fractured rock. A total of 29 monitoring points were installed over an area of three city blocks. The monitoring points ranged in depth from 15 to 45 feet below ground surface. The consultant also utilized 14 monitoring points from three neighboring gas station investigations.

With the help of video borehole logging, a major fracture zone in the bedrock was identified. In general, contaminated groundwater prefers to flow through the easy paths of open fractures as opposed to smaller cracks within tight rock. The video log information greatly assisted in accurately placing the well screens, or range of collection, within the monitoring points. This helped keep the investigation on track and contain costs by minimizing the number of wells needed to find the contamination.

Investigation and Removal at Neenah Dry Cleaner Site Tackles Tough Cleanup (con't.)



Groundwater contamination has been confirmed approximately 375 feet south of the source area and at a maximum depth of 30 feet. While investigation continues, it appears that the contamination is mingling with a separate chlorinated release from another location, which increases the difficulty of addressing the contamination.

The consultant also investigated the possibility that vapors from the contamination were migrating into nearby residences. Sampling of the soil gas beneath the basement floor of a nearby residence revealed that vapors were not migrating into the residence.

Success

The VEGE system was shut down in September, 2003, to evaluate the remaining contamination under steady-state conditions, (i.e. without the influence of the VEGE system. During operation, the VEGE system removed 246 pounds of product (i.e. perc) from soil vapor, 1.92 million gallons of contaminated groundwater and 75 pounds of product from groundwater. Concentrations of contaminants were also reduced between 96-99 percent in the source area.

In order to put the success of the VEGE extraction into perspective, the maximum groundwater contaminant concentrations at the source area, and concentrations prior to shutting down the VEGE system are listed below in parts per billion (ppb):

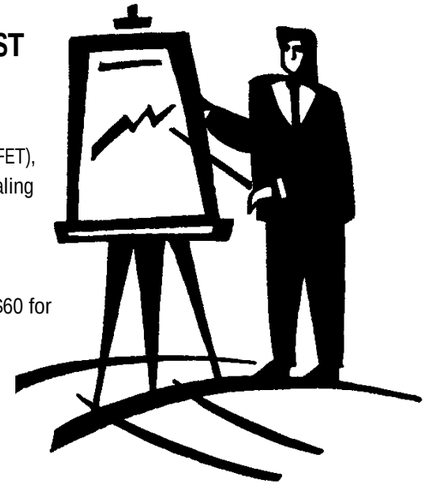
Maximum Concentrations	**Concentrations in September 2003**
tetrachloroethene (PCE) = 86,000 ppb	PCE = 1,330 ppb
trichloroethene (TCE) = 6,400 ppb	TCE = 526 ppb
cis-1,2-dichloroethene (DCE) = 19,000 ppb	cis-1,2-DCE = 627 ppb
vinyl chloride (VC) = 1,600 ppb	VC < 5.5 ppb

[Editor's note: perchloroethylene, perchloroethene, and tetrachloroethene are synonyms for the same chemical.]

After evaluation of the remaining groundwater contamination under steady-state conditions, the consultant will propose a long-term cleanup plan. The VEGE system remains in place and can be utilized or modified in the future if needed.

If you have any questions in regard to this project, please contact RR's Jennifer Borski at 920-424-7887, or jennifer.borski@dnr.state.wi.us.

RR Program's Northeast Region To Host Consultant's Day



The DNR's RR Program and the Federation of Environmental Technologists (FET), Inc., are co-sponsoring a one-day seminar for environmental consultants dealing with contaminated properties on Wednesday, March 31st, at Liberty Hall, 800 Eisenhower Drive, Kimberly.

Registration will be from 8-8:30 a.m. Costs include: $90 for attendees and $60 for DNR and Department of Commerce staff; fee includes lunch. For additional information on how to register and how to obtain registration materials, please contact FET at 262-644-0070, or fet@hnet.net.

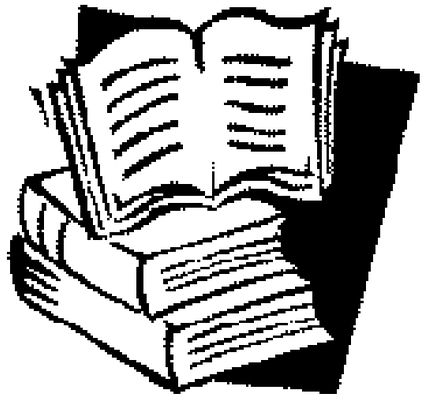
RR Program's West Central Region To Host A Series Of Consultant Days

The DNR's West Central Region RR Program staff are sponsoring a serie[illegible] environmental consultants dealing with contaminated properties at the[illegible] times and locations:

Tuesday, May 4, 2004 **12:30 p.m. – 4:00 p.m.**	DNR Service Center – Eau Claire 1300 West Clairemont Avenue Eau Claire, WI 54702
Wednesday, May 5, 2004 **12:30 p.m. – 4:00 p.m.**	DNR Service Center – Baldwin 890 Spruce Street Baldwin, WI 54002
Tuesday, May 25, 2004 **12:30 p.m. – 4:00 p.m.**	UW-Stevens Point University Center Room 207 1015 Reserve Street Stevens Point, WI 54481
Wednesday, May 26, 2004 **12:30 p.m. – 4:00 p.m.**	DNR Service Center – La Crosse 3550 Mormon Coulee Road La Crosse, WI 54601

Registration at each location will be from 12:30-1:00 p.m on the date specified. There are no registration fees for these seminars. However, space is limited; please register early. Agenda topics and registration materials are available at http://www.dnr.state.wi.us/org/aw/rr/general/calendar.htm. For more information, please contact Mae Willkom at 715-839-3748, or mae.willkom@dnr.state.wi.us.

New, Revised Publications Available



New Sediment Quality Guidelines Published
The DNR's Contaminated Sediment Standing Team has prepared an interim final guidance entitled Consensus Based Sediment Quality Guidelines: Recommendations for Use and Application.This guidance is intended to assist both agency staff and the public in addressing contaminated sediment issues. As interim guidance, it will be reviewed and updated as more experience is gained in addressing sediment concerns throughout the state.
To view the guidance, please use the following link: http://www.dnr.state.wi.us/org/aw/rr/technical/cbsqg_interim_final.pdf. For more information, please contact Margaret Brunette at 414-263-8557, or margaret.brunette@dnr.state.wi.us.

New Spill Response Fact Sheet Available
A new fact sheet entitled Mechanical and Chemical/Biological Spill Response Methods (publication #RR-710) is now available. The fact sheet discusses the response methods that are allowed in Wisconsin for spills on both land and water, and also has contact information for DNR's regional spill coordinators. To view the fact sheet, please use the following link: http://www.dnr.state.wi.us/org/aw/rr/archives/pubs/RR710.pdf, or contact Robin Schmidt at 608-267-7569 or robin.schmidt@dnr.state.wi.us for more information.

New Fact Sheet Available on Smear Zone Contamination
A new fact sheet, entitled Smear Zone Contamination (publication #RR-712), clarifies that sites closed with contamination that exceeds soil standards in the smear zone (where free product was smeared due to a fluctuating water table) will be added to the GIS Registry. The fact sheet is available at the following link: http://www.dnr.state.wi.us/org/aw/rr/archives/ pubs/RR712.pdf.

RR Staff Changes

Northeast Region
Aimee Wolfgram will be working as the Department of Transportation (DOT) hydrogeologist LTE (which stands for "Limited Term Employee") for the RR Prog in the DNR's Oshkosh Service Center. Previously, Aimee had worked for a num of years as a consultant at a local firm. Welcome Aimee!

Northern Region
William Roberts will be working as the DOT hydrogeologist LTE for the RR Program in the DNR's Northern Regional Office (NOR) in Rhinelander. William also works as a NOR septage coordinator in the Waste Program, and brings more than five years of private sector experience as a technician, hydrogeologist and project manager to the Program. Welcome William!

RR Staff Changes (con't.)

The RR Program has also completed the following new assignments for staff in the Northern Region (ERP stands for Environmental Repair Program and LUST stands for Leaking Underground Storage Tanks).

Ashland	Chris Saari, 715-685-2920 [ERP and LUST sites]
Barron	William Schultz, 715-365-8965 [ERP and LUST sites]
Bayfield	Chris Saari, 715-685-2920 [ERP and LUST sites]
Burnett	Phil Richard, 715-762-4684 Ext. 115 [ERP and LUST sites]
Douglas	Jim Hosch (Superior), 715-392-0802 [ERP and LUST sites]
	Chris Saari (except Superior), 715-685-2920 [ERP and LUST sites]
Florence	Chuck Weister, 715-365-8941 [ERP and LUST sites]
Forest	Chuck Weister, 715-365-8941 [ERP and LUST sites]
Iron	Chris Saari, 715-685-2920 [ERP and LUST sites]
Langlade	John Sager, 715-623-4190 Ext. 3125 [ERP and LUST sites]
Lincoln	John Sager, 715-623-4190 Ext. 3125 [ERP and LUST sites]
Oneida	Chuck Weister, 715-365-8941 [ERP and LUST sites]
Polk	Phil Richard, 715-762-4684 Ext. 115 [ERP and LUST sites]
Price	Phil Richard, 715-762-4684 Ext. 115 [ERP and LUST sites]
Rusk	William Schultz, 715-365-8965 [ERP and LUST sites]
Sawyer	Jamie Dunn, 715-635-4049 [ERP and LUST sites]
Taylor	John Sager, 715-623-4190 Ext. 3125 [ERP and LUST sites]
Vilas	Chuck Weister, 715-365-8941 [ERP and LUST sites]
Washburn	Jamie Dunn, 715-635-4049 [ERP and LUST sites]

Team Supervisor - John Robinson, 715-365-8976
Program Assistant - Janet Kazda, 715-365-8990
Program Assistant - Danielle Lancour 715-623-4190, ext. 3126
Spills Coordinator - Norm Dunbar 715-365-8963
Brownfields Coordinator - Dan Boardman 715-365-8943
Brownfields Outreach LTE - Regina Hasken 715-365-8902
DOT LTE (Dist. 7)/GIS LTE - Greer Lundquist 715-365-8970
DOT LTE (Dist. 8)/GIS LTE - William Roberts 715-365-8979
NSP LTE - Shelley Klitske 715-635-4122
Clerical LTE - Sherrie Belliveau 715-365-8996

West Central Region
Mike Hanten will be the new DOT hydrogeologist LTE for RR out of the Wausau office. Mike comes from the DNR's Northeast Region, where he worked as a water supply specialist. Welcome Mike!

Kitt Sigfried is also a new DOT hydrogeologist LTE for RR, working in the Eau Claire office. Kitt comes from Grand Forks, North Dakota, where she worked as a pilot for 15 years. Welcome Kitt!

Southcentral Region
The RR Program has completed new assignments for staff in the southcentral region. For more information, please see the following link: http://www.dnr.state.wi.us/org/aw/rr/general/scr_staff_changes.pdf.

RE NEWS

RELEASE • RESTORE • REDEVELOP

For More Information: *Re News* **is published quarterly by the Wisconsin Department of Natural Resources Bureau for Remediation and Redevelopment.**

This newsletter is available in alternate format upon request. Please call 608-267-3543.

Our Web Site Is : http://www.dnr.state.wi.us/org/aw/rr

Refer comments and questions to : **Bureau For Remediation & Redevelopment**
Wisconsin DNR
P.O. Box 7921
Madison, WI 53707 608-261-6422

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services and functions under an Affirmative Action Plan.

This newsletter may contain summary information about certain state statutes and/or rules and does not include all of the details found in the statutes/rules. Readers should consult the actual language of the statutes/rules to answer specific questions.

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Permit No. 906